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Proceedings of the Maritimes Regional Advisory Process of Georges Bank Scallop Stock Status

20 April 2006

Hayes Boardroom
Bedford Institute of Oceanography
Dartmouth, Nova Scotia

Ross Claytor (Chair)

Bedford Institute of Oceanography
1 Challenger Drive, P.O. Box 1006
Dartmouth, Nova Scotia
B2Y 4A2

Compte rendu des réunions du Processus consultatif régional des provinces Maritimes concernant l'état du stock de pétoncle du banc Georges

20 avril 2006

Salle de conférences Hayes
Institut océanographique de Bedford
Yarmouth, Nouvelle-Ecosse

Ross Claytor (Président)

Institut océanographique de Bedford
1 Challenger Drive, C.P. 1006
Dartmouth (Nouvelle-Écosse)
B2Y 4A2

March 2007 | mars 2007

Canada

Foreword

The purpose of these proceedings is to archive the activities and discussions of the meeting, including research recommendations, uncertainties, and to provide a place to formally archive official minority opinions. As such, interpretations and opinions presented in this report may be factually incorrect or miss-leading, but are included to record as faithfully as possible what transpired at the meeting. No statements are to be taken as reflecting the consensus of the meeting unless they are clearly identified as such. Moreover, additional information and further review may result in a change of decision where tentative agreement had been reached.

Avant-propos

Le présent compte rendu fait état des activités et des discussions qui ont eu lieu à la réunion, notamment en ce qui concerne les recommandations de recherche et les incertitudes; il sert aussi à consigner en bonne et due forme les opinions minoritaires officielles. Les interprétations et opinions qui y sont présentées peuvent être incorrectes sur le plan des faits ou trompeuses, mais elles sont intégrées au document pour que celui-ci reflète le plus fidèlement possible ce qui s'est dit à la réunion. Aucune déclaration ne doit être considérée comme une expression du consensus des participants, sauf s'il est clairement indiqué qu'elle l'est effectivement. En outre, des renseignements supplémentaires et un plus ample examen peuvent avoir pour effet de modifier une décision qui avait fait l'objet d'un accord préliminaire.

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ABSTRACT

These proceedings record discussions that were held during the Regional Advisory Process (RAP) meetings for Georges Bank scallop stocks on April 20, 2006. This meeting was attended by members of the offshore scallop industry, DFO Science Branch staff, and Fisheries and Aquaculture Management staff. It was the first assessment of the Georges Bank offshore scallop stock since 2003. A Science Advisory Report was reviewed at this meeting.

RÉSUMÉ

Le présent compte rendu reflète les discussions tenues lors des réunions du Processus consultatif régional (PCR) du 20 avril 2006 ayant porté sur les stocks de pétoncle du banc Georges. La réunion dont il ici question regroupait des membres de l'industrie de la pêche hauturière du pétoncle ainsi que des membres de l'équipe des Sciences et de la Gestion des pêches et de l'aquaculture du MPO. Elle avait pour but de procéder à la première évaluation du stock de pétoncle de haute mer du banc Georges depuis 2003. Un Avis scientifique a été examiné à cette réunion.

INTRODUCTION

The chair, Ross Claytor of the DFO, opened the meeting. The remit was identified as:

1. assess the status of the resource,
2. provide harvest advice for the 2006 fishery, and
3. provide the methodology for annual advice until the next RAP.

Angelica Silva and Ginette Robert provided a working paper at the meeting 'Georges Bank Scallop Stock Assessment – 2006' as supporting documentation for satisfying the remit. A presentation by Angelica Silva summarized the material in the document.

External reviewers were Bob Mohn and Sherrylynn Rowe. They provided initial comments on the working paper and presentation by section of the document. After these comments the chair opened the meeting to the floor for additional comments.

Upon completion of the review of the working paper, the text of the Science Advisory Report (SAR) was reviewed.

OVERVIEW OF WORKING PAPER

The working paper consisted of the following sections: Commercial fishery data, Research survey, Stock analysis, and Stock projections. The outline of the SAR was followed for review. These sections were the fishery, resource status, sources of uncertainty, and conclusions and advice.

Fishery Background:

The sea scallop, Placopecten magellanicus, is found only in the Northwest Atlantic, from Cape Hatteras to Labrador. Scallops are aggregated in patches and harvestable concentrations are called beds. Major areas of offshore fishing activity are Georges Bank, the Eastern Scotian Shelf (Middle Grounds, Sable Island Bank, and Western Bank), Browns Bank, German Bank, and St. Pierre Bank (south of Newfoundland). Scallops prefer a sandy, gravel bottom and occur in depths of 35 to 120m on the offshore banks.

The offshore scallop fleet consists of wet fish vessels and freezer-trawlers. Generally, these vessels simultaneously fish two New Bedford offshore rakes or drags, 4 to 6.1 m width, one on each side of the vessel.

Annual assessments of the status of the offshore scallop resource take into account the annual survey findings, meat size distribution in the catch and fishery performance. The management of the main scallop fishery in Georges Bank refers to zone 'a' and is the focus of this document. Georges Bank zone 'b' is a marginal growth area for scallops and has a separate management plan.

The 2005 management plan for zone 'a' included a TAC of 2500 t and a meat count of 33 meats per 500 grams. The 2005 management plan for zone 'b' included a 200 t rolling TAC and a meat count of 50 meats per 500 grams. A rolling TAC quota for zone 'b' is evaluated at the end of the each fishing period; if commercial catch rates (CPUE) and meat counts are maintained, a further 200 t rolling TAC may be considered for the rest of the fishing period. Even when these

conditions are met, industry may decide not to implement the second roll. The 200 t TAC has not been rolled over since 2002, although extensions to the fishing period have occurred.

SUMMARY OF RESULTS

- Sea scallops on Georges Bank have been fished year round by the Canadian offshore scallop fleet under TAC since 1986. Prior to 1998, this area was managed as one unit but since 1998, it has been managed as two-zones, zone 'a' the traditional scallops grounds (a more productive area) and zone 'b' (a marginal production area).

- The 2005 TAC was 2500 t for zone 'a' and 200 t for zone 'b'. Total reported landings were 2484 t for zone 'a' and 201 t for zone 'b'. This year landings for zone 'a' are the lowest since 1998, landings for zone 'b' have remained at 200 t since 2002.

- The offshore scallop fleet fished primarily fresh scallop products until 2002. Since then, the offshore scallop fleet has incorporated the use of freezer trawlers. In the first year of fishing the freezer-trawlers landed nearly 10% of the TAC. In 2005, the freezer-trawlers have landed 57% of catches from zone 'a' and 58% of catches from zone 'b'.

- The 2005 fishing pattern shows a broad coverage of Georges Bank, albeit a higher concentration of effort on the northern edge of the Bank occurred consistently throughout the year.

- Commercial catch rates reached historical high levels during 2000 - 2002 and have since declined to average levels.

- Survey catch rates for scallops in zone 'a' for both recruits (age 4+) and pre-recruits (age 3) peaked in 2000. The age 4+ numbers per tow declined since 2000, with a slight recovery in 2005 to above the long-term average. The age 3 numbers per tow declined from 2000 to 2003 and has increased during the last two years to above the long-term average.

- The fishery targeted biomass (ages 4 to 7) for zone 'a' from a population model has been declining since a peak in 1999. In 2005, it is estimated at 15,000 t, which corresponds to the long-term average. In 2005, age 5 scallops contributed 28% of the targeted biomass and new recruits at age 4 contributed only 16%.

- A range of 2006 TAC scenarios for zone 'a' from 2,500 t to 8,000 t are expected to produce exploitation rates of 8 to 32% on the targeted biomass (Age 4-7), and declines in targeted biomass of 2 to 32%.

COMMENTS, QUESTIONS, RECOMMENDATIONS, AND DISCUSSION

Comments and questions occurred throughout the discussion of the working paper. These have been organized by topic of the working paper. Sometimes the comment or question occurred and no answer or response was possible. These are left for future authors to consider for the next assessment. At other times, a response was possible and these are indicated.

Reviewer numbers do not always refer to the same individual but the order in which the comments were made. *Response* refers to a response by one of the authors of the working paper unless otherwise indicated.

The Fishery:

Reviewer #1
Zones A and B: are catches from the Canadian portion of the fishery.
Response
Yes, prior to 1984 only Canadian data.
Industry
Different meat count in b from 33 in A to 50 in B. Once they start fishing they move around.

Reviewer #2
In B fishing started Mar. 1, fits in first quarter.
Response
Declines in CPUE are in relation to peak years.

Reviewer #1
- Figures 1 and 2, zone a and b , what are the vessel types. Monitoring of meat count covers 100%. At each landing a sample from a boat is taken?
- Rolling TAC has not rolled since 2002. Why did it not roll over. Fish in 'b' for six weeks. Performance is monitored then rolls over. On the basis of 200t being taken. Since 2002, was the TAC taken.

Response
In landings, keep track of meat counts. 92-96% are meat only.

Reviewer #1
- Since 1972, qualitative descriptions would prefer to see value of long-term median to current year. Show numbers or plot long-term on figures.
- In 2005 the fishing activity was consistently intense in the northern area of the bank. Fishing effort in Fig 3: is every signal registered.

Response
Yes, most of the fishing is on the north. Speed of the vessel affects the number of points. If the vessel is not fishing the speed is > 5 knots. If vessel is <5 knots it is in fishing mode.

Reviewer #1
So the map includes only fishing time?
Response
Number of hours of polling does not necessarily relate to hours of fishing effort.

Reviewer #1
Meat weight was less than recent years. Is it because of industry taking smaller scallops or reduced growth?
Response
Reduced growth mostly, age 4 – 5, trend with meat weight being smaller now than in previous years. Scallop at age 4 are about 15g in size. There is fishing of 33 meat counts and also monitoring of small meat sizes. Age of scallops taken in 2005, similar throughout the time period. Meat sizes were larger in 2000 than now.

Reviewer #1
The mean age in catch could be examined.
Response
Reduced growth is not the main factor. There are questions of year-class strength. As long as meat count is met, then fishing will be for abundance. There were good year-classes in earlier period.

Reviewer #1
How does meat weight differ between zone A and B? Age 5 in B would never be as high as in A? Are there any vessel differences?
Response
Vessels are similar enough so that wet fish and freezer trawlers so that focussing on wet fish provides adequate data.

Reviewer #2
- How well do the pieces fit? For example, on page 7, do we see cohorts in the commercial data. Catch rate at age would be a nice complement to the survey. CPUE data is hard to apply directly to analysis.
- CPUE is reported in kg/hour and sometimes Crew/metre/hour, stadardize and perform linear model analysis.

Resource Status:

Reviewer #1
- Two metrics of catch rate are used. Kg/ hour and crew/hour/metre. Crew hour metre, is it appropriate given differences among individuals. Kg/ hour might be better. Monthly CPUE is stable.
- Are wet fish and freezer trawlers kept separate?

Response
They will be when more data is available.

Reviewer #1
Georges Bank has been bottom mapped?
Response
These have been available since 2002. Some companies do not have them. Scallops have been known for a long time and a good skipper does not need a bottom map.

Reviewer #1
- Need to add a comment that bottom mapping does not affect effort efficiency.
- There are holes in the map of fishing effort.

Response
Fishing location depends on scallop settlement and this is irregular.

Reviewer #1
The survey is stratified by CPUE. If no scallop are caught in an area is it not surveyed.
Response
Stratified for 150 tows. Depends on need, there are exploratory tows. These are additional tows that would be made on the southern portion and pro-rated by area.

Reviewer #1
The area surveyed is not constant over time?
Response
Overall the survey area is constant but allocated to strata is different.

Reviewer #1
In Fig. 7, 4+ group does not track with age 3's.
Response
Hard for age 3 to track 4+.

Reviewer #1
If recruitment events comes it should precede bump in 4+. Need abundance at age in the fishery. Survey is stratified to previous 9 months?
Response
CPUE from October to June is used.

Reviewer #1
So consistently three months are not used?
Response
Historically quarters with the least amount of activity, but needs to be re-examined.

Reviewer #1
Are exploratory tows included in the analysis.
Response
Qualitatively

Reviewer #1
Exploratory tows are assigned at sea?
Response
Table 8a shows allocation by strata as CPUE changes.

Reviewer #1
Spatial age-distribution, but similar for younger ages.
Response
Age 2 – 3 are in Res Doc.

Reviewer #1
What is the appearance of the growth curve? At what age to we expect an asymptote?
Response
Table 7 is shell height 1982-1989, around age 10.

Reviewer #1
Biomass estimates, how much of a contribution does each age-class make?
Response
This is used to determine age. Port sampling data is linked to meat weight.

Reviewer #1
Biomass estimates include A and B, not just A.
Response
Just A.

Reviewer #1
Assuming constant growth over time is a dangerous assumption. Meat weight data is converted to shell height. Shell heights to age based on Von B.
Response
It is a question of resources; there is limited sample sizes.

Reviewer #1
How was meat weight derived? If assuming constant growth. How was meat weight predicted?
Response
Biological data from survey. Meat weight for 100 mm shell, lth vs weight for each year.

Reviewer #2
There seems to be a low period then a high period.
Response
A sudden shift on average of 20% suddenly put animals into the wrong bin, Table 7. If it is half a year's growth it will not matter too much. There is a seasonal component to meat yield. Same portion for each quarter of the year. The window during August is the best window. This is the best time to look at environmental effects. Animals have good meats and are about to spawn.

Reviewer #1
The proportion of the survey changed over time. A is separate in analysis?
Response
About 105 of the tows. A is separate.

Reviewer #2
Table 12, is not necessary to include. Stratification seeks to improve an estimate, but you are not sampling where variance is high. Table 8, for each strata, add mean and variance. Are exploratory tows used or not?
Response
When they add an area they are used, when they are used for juveniles they are not.

Reviewer #2
In 2003, a sixth strata was used in the estimate. Fig. 9, do pre-recruits come from recruits? The management plan is set up to preserve recruits, plot the stock recruitment curve.

Reviewer #1
Does the model use >100mm.
Response
Biomass is given in Fig. 9 is the survey area.

Reviewer #2
Summary of ages put in plus group would be useful. If the resource is well managed should see an accumulation of older animals.

Others:
Is there utility in normalizing biomass index?

Reviewer #1
More information is required on inputs to model.
Response
See page 3.

Reviewer #2
Partial selection fixed for ages 1 and 2
Response
This was not needed.

Reviewer #2
Residual plots, bubble plots, CPUE bubble and RV survey. What has been different in the last three years. 2 indices of abundance are measuring the same thing. Survey and CPUE both same role in model. Last three years one says better and one say poorer. Any explanation.
Response
More freezer trawlers in recent years. Since 2002 freezer trawlers larger portion of the fishery. Meat weight is the same between wet fish and freezer trawlers.

Reviewer #2
- Is there a conversion factor between these vessels. How could an increase in freezer trawlers introduce a bias. Industry is usually better at keeping up CPUE than survey. One more figure with ages 4- 8 in both for display purposes would be helpful. Perhaps the difference is because of age 3's .
- Retrospective is surprisingly good.
- Usually VPA, cannot follow rapid falls, this one did. For some reason, the good years were not fit by the model. Where surveys were good the model did not go up.
- Age structure should be added to the model.
- Some continuity in the last three years provide stability.
- In 2003, would be worried about projection but stability is useful and gives more confidence in projections.
- Coefficient of variation on q's for survey (page 4).

Reviewer #1
Year-class at pre-recruit stage is difficult to estimate.
Response
Catch is variable for a variety of reasons of young in survey. They are highly aggregated and may not see them.

Reviewer #2
Table 6. Is 8 a plus group.
Response
Yes

Reviewer #2
Bad news, harder to fit model with plus group. Should examine code to see how plus group is being handled. In days of hard fishing, no difference, but not there may be.

RAP Process

Reviewer #1
Docmentation needs to be available sooner. Difficult to review because did not receive the document.

Reviewer #2
Technical review and public review. May not do a good job at either. Not comfortable with diagnostics or details.

Other Items in Review of SAR:

Reviewers
Does the exploitation rate represent the average. Is it the average F's over age over quarters and is it converted to annual rate?

Sources of Uncertainty: Difficulty in aging and changes in growth, a sentence should be added to that effect.

This assessment has a biomass of older animals and a good survey.

Non-RAP year advice: The expert opinon may be used. Based on fisheries management, industry would like to participate.

Appendix 1. Invitation Letter.

Science Branch, Maritimes Region
Bedford Institute of Oceanography
P.O. Box 1006, 1 Challenger Drive
Dartmouth, NS B2Y 4A2
Tel.: (902) 426-4721 / Fax: (902) 426-1506
e-mail: claytorr@mar.dfo-mpo.gc.ca

4 April 2006

Distribution

Subject: Assessment of Georges Bank Scallop Stock Status

The assessment of the Georges Bank scallop stock in the Maritimes Region will be reviewed on 20 April 2006, in the Hayes Boardroom of the Bedford Institute of Oceanography, Dartmouth, Nova Scotia, from 9:00 AM to 4:00 PM

The purposes of the meeting is to:

1. assess the status of the resource,
2. provide harvest advice for the 2006 fishery, and.
3. provide the methodology for annual advice until the next RAP.

This peer review includes review of the stock assessment and draft Science Advisory Report. Output from the meeting will also include a Research Document and Proceedings.

I would appreciate if you could confirm your attendance with Valerie Myra at (902) 426-7070 (myrav@mar.dfo-mpo.gc.ca).

We greatly appreciate your contribution to this valuable exercise.

NOTE: *For security reasons, non-federal government participants are required to report to the Commissioner at the Front Desk and sign-in to obtain a visitor's pass. Inform the Commissioner which meeting you are attending and someone will be contacted to escort you through the building to the Hayes Boardroom.*

Direction des Sciences, Région des Maritimes
Institut océanographique de Bedford
C. P. 1006, 1, promenade Challenger
Dartmouth, (N.-É.) B2Y 4A2
Tél. : (902) 426-4721 / Fax : (902) 426-1506
Courriel : claytorr@mar.dfo-mpo.gc.ca

Le 4 avril 2006

Liste de diffusion

Objet : Évaluation du stock de pétoncle du banc Georges

La réunion d'évaluation du stock de pétoncle du banc Georges, Région des Maritimes, aura lieu le 20 avril 2006, dans la salle de conférences Hayes de l'Institut océanographique de Bedford à Dartmouth, de 9 h à 16 h.

Objet de la réunion

1. évaluer l'état de la ressource;
2. formuler un avis sur le niveau de capture pour la pêche de 2006;
3. établir la méthode à suivre pour produire l'avis annuel jusqu'au prochain PCR.

Cet examen par les pairs comprend un examen de l'évaluation de stock et d'une ébauche d'Avis scientifique. La réunion aboutira aussi à la production d'un Document de recherche et d'un Compte rendu.

Je sous serais reconnaissant de bien vouloir confirmer votre présence en communiquant avec Valerie Myra, au (902) 426-7070 (myrav@mar.dfo-mpo.gc.ca).

Nous vous remercions vivement de votre participation à cet important processus.

REMARQUE : *Pour des raisons de sécurité, tous les participants à la réunion qui ne travaillent pas au gouvernement fédéral devront se présenter au commissionnaire présent à la réception et signer le registre des entrées pour obtenir un laissez-passer. Ils devront indiquer au commissaire à quelle réunion ils vont participer et quelqu'un viendra les chercher et les accompagner jusqu'à la salle de conférences Hayes.*

Original signed by / Copie originale signée par :

Ross Claytor
Science Branch, Maritimes Region / Direction des Sciences, Région des Maritimes

cc: M. Sinclair, Regional Director, Science / directeur régional, Sciences
R. O'Boyle, Associate Director, Science / directeur délégué, Sciences
V. Myra, RAP Office, Science / Bureau du PCR, Sciences
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Ian Marshall, DFO/MPO, Yarmouth
Peter Hurley, Maritimes

Industry / Provincial /
Industrie / Province

Bruce Osborne, Provincial Fisheries / min. de l'Agriculture, des Pêches et de l'Aquaculture de la province
Roger Stirling, SPANS

Appendix 2. Meeting Remit.

ASSESSMENT OF GEORGES BANK SCALLOP STOCK STATUS

20 April 2006
9:00am – 4:00pm

Hayes Boardroom
Bedford Institute of Oceanography
1 Challenger Drive
Dartmouth, NS

TERMS OF REFERENCES

Context

The last RAP for Georges Bank scallops was held in June 2003. Changes in the fishery and in the biomass require an assessment based on the current population and fishery status.

Objectives

Assess the status of the resource

- Provide harvest advice for the 2006 fishery.
- Provide the methodology for annual advice until the next RAP

Outputs

CSAS Science Advisory Report
CSAS Research document
CSAS Proceedings

Participants

DFO Science
DFO Fisheries & Aquaculture Management
NS Provincial Representatives

Fishing Industry

ÉVALUATION DE L'ÉTAT DU STOCK DE PÉTONCLE DU BANC GEORGES

20 avril 2006
9 h – 16 h

Salle de conférences Hayes
Institut océanographique de Bedford
1, promenade Challenger
Dartmouth, (N.-É.)

CADRE DE RÉFÉRENCE

Contexte

Le dernier PCR sur le pétoncle du banc Georges remonte à juin 2003. En raison de changements dans la pêche et dans la biomasse, il est nécessaire de procéder à une évaluation fondée sur l'état de la population et de la pêche actuellement

Objectifs

Évaluer l'état de la ressource :

- Formuler un avis sur le niveau de capture pour la pêche de 2006.
- Établir la méthode à suivre pour produire l'avis annuel jusqu'au prochain PCR.

Résultats

Avis scientifique du SCCS
Document de recherche du SCCS
Compte rendu du SCCS

Participants

MPO – Sciences
MPO – Gestion des pêches et de l'aquaculture
Représentant du gouvernement de la Nouvelle-Écosse
Industrie de la pêche

Appendix 3. Meeting Agenda.

ASSESSMENT OF GEORGES BANK SCALLOP STOCK STATUS

20 April 2006

Hayes Boardroom
Bedford Institute of Oceanography
1 Challenger Drive
Dartmouth, NS

ÉVALUATION DE L'ÉTAT DU STOCK DE PÉTONCLE DU BANC GEORGES

Le 20 avril 2006

Salle de conférences Hayes
Institut océanographique de Bedford
1, promenade Challenger
Dartmouth, (N.-É.)

Proposed Timetable / Emploi du temps proposé

April 20 /Le 20 avril	*Time / Heure*	***Lead / Responsable***
Introduction	09:00-09:10 / de 9 h à 9 h 10	R. Claytor Chairman / Président
Scallop: Georges Bank / Pétoncle du banc Georges	09:10-10:00 / de 9 h à 10 h	A. Silva
Critique and / et discussion SSR Georges Bank Scallop / RES, pétoncle du banc Georges	10:00-14:00 / de 10 h à 14 h	All / Tous

Appendix 4. List of Participants.

Area code = 902 unless otherwise indicated.

Name	Organization	Phone	Fax	e-mail
Angelica Silva	DFO	426-6525		silvaA@mar.dfo-mpo.gc.ca
Greg Stevens	DFO	426-5433		stevensG@ mar.dfo-mpo.gc.ca
Ginette Robert	SPANS	469-6897		g.Robert@ns.sympatico.ca
Peter Hurley	DFO	426-3520		hurleyp@ mar.dfo-mpo.gc.ca
Jim Mosher	Clearwater	634-4914		Jim.mosher@scotiatrawler.com
Bob Mohn	DFO	426-4592		mohnR@ mar.dfo-mpo.gc.ca
Maxine Westhead	DFO	426-4215		westheadM@ mar.dfo-mpo.gc.ca
Roger Stirling	SPANS	463-7790	469-8294	spans@ns.sympatico.ca
Sherrylynn Rowe	DFO	426-8039		rowes@ mar.dfo-mpo.gc.ca
Amy Chisholm	DFO	426-5342		chisholmA@ mar.dfo-mpo.gc.ca
Christine Penney	Clearwater	457-2348	443-8443	cpenney@clearwater.ca
Bill Whitman	NSFA	424-0336	424-1766	whitmanE@gov.ns.ca

Appendix 5. Pre-RAP Meeting; 4 April 2006.

A pre-RAP meeting was held on April 4, 2006. The minutes are included below:

George's Bank Scallop
Pre-RAP Review
April 4, 2006
6th floor Gully Boardroom

Attendees:

Ross Claytor (Chair)	DFO	Ginette Robert	SPANS
Peter Hurley	DFO	Roger Stirling	SPANS
Angelica Silva	DFO	Jim Mosher	Clearwater
Amy Chisholm	DFO		

Note: Designated reviewers for the RAP, Sherrylynn Rowe and Bob Mohn were not able to attend this meeting.

Agenda:

Review analyses to date with respect to the Terms of Reference
Terms of reference

1. Assess the status of the resource
2. Provide harvest advice for 2006
3. Provide methodology for non-RAP years

Notes:

Georges Bank Data

1. 150 tows in Georges *a* and *b* are made during the August survey randomly stratified on basis of catch and effort from October to June.
2. Exploratory tows are used to identify specific age groups by areas.
3. Fixed station survey during May to monitor shell height.
4. Catch and effort from vessels during the season.
5. Meat sampling from landings.

Management of Georges Bank is by area *a* where most of the fishing and production occurs and *b* a lower production area.

Georges Bank ***a*** is managed by an interim TAC set in Dec. and a final TAC that may be set at any time during the year at an Offshore Scallop Advisory Committee (OSAC) meetings.

Georges Bank ***b*** is managed by a rollover TAC, which has usually been initially set at 200t, although this is not a rule designated by the management plan. When the 200t is close to being caught commercial CPUE and meat weights are evaluated to see if the TAC should be rolled over. These procedures are detailed more completely in the section that will 'Provide methodology for non-RAP years'.

The order of fishing Georges A versus Georges B is flexible. Sometimes Georges Bank ***b*** will be fished instead of Georges Bank ***a*** in order to allow for more growth to occur in Georges Bank ***a*** and increase the yield before harvest.

The assessment will consist of two 'chapters'. Georges Bank ***a*** and Georges Bank ***b***.

Industry seed boxes are sometimes used to protect concentrations of 2 year olds. The industry voluntarily does not fish in these areas. Survey data is used to identify if any of these areas should be considered for industry seed boxes.

Fleet:

The fleet consists of wet fish boats that land a raw product and freezer trawlers (FAS) which land frozen product.

There are differences in fishing power between these boats.

A majority of the catch and effort is currently by FAS boats.

Currently in Fig. 2 both types of boats are used.

ACTION: Document raw effort and catch by fleet in tables and figures.

Only the wet fish CPUE is used as an abundance index in the assessment.

Subsequent figures required clarification on whether they were only Georges Bank ***a*** or both areas combined.

ACTION: Ensure that figures are clearly labeled as to content by area.

ACTION: Data and indices should be confined to Georges Bank ***a*** for the Chapter on ***a*** as much as possible.

Fig 7. High productivity areas. Units are kg/ crew-hour-meter. A crew-hour-meter is the amount of time the gear is on the bottom *x* the width of the gear *x* the number of crew members shucking scallops.

ACTION: Provide definition in working paper.

Survey:

Survey is stratified by catch and effort in the preceding 9 months of the fishery.
Question: Does this mean Dec. 2004 to August 2005 for the August 2005 survey.
Stratification occurs by five levels of CPUE defined as: kg/ crew-hour-meter

1) 0.1 - 0.199
2) 0.2 – 0.249
3) 0.25 – 0.999
4) 1.00 – 1.999
5) 2.00 +

These levels are then contoured and the number of sets in each contour is calculated by multiplying the percentage of area occupied by a given level times 150.

Exploratory tows over and above the 150 are used to cover areas the fleet does not fish and are primarily used to check for age 2 and 3 scallops.

ACTION: Show a series of maps or tables that describe how the survey is stratified and the number of sets in each area is determined.

ACTION: Present the Survey CPUE and Biomass index trends so that they can be directly compared. For example show a line for age 3, age 4, and 5+ in each.

ACTION: Use pie charts to show age distributions in maps.

ACTION: Indicate ***a*** and ***b*** lines on maps. Do this for only one year if many years are shown on a page and for each map that appears on a separate page.

Fig. 11 Meat weight (condition) trends for age 5 are shown to help explain changes in CPUE.

Fig. 12 Estimated biomass

ACTION: Provide input parameters for ADAPT runs.

ACTION: Provide a complete description of method including quarterly estimates.

ACTION: Provide diagnostics.

ACTION: Bring your crayolas.

Projections:

ACTION: Bring data for inputs into projections.

Provide methodology for non-RAP years

An example:

In Dec an Interim TAC is set for Georges Bank ***a*** using the raw data from the previous August survey, preliminary Fleet CPUE, and the distribution of year-classes from the survey. A relative procedure is used based on trends in abundance over time and expected recruitment. This is generally set conservatively.

In March or April a final TAC for the fishing year is determined. This TAC is set using analyses as presented in the RAP based on the previous August survey and fishing fleet CPUE, and distribution of recruitment.

The Science analyses that contribute to this decision are recorded in the OSAC minutes.

Ginette Robert provided some examples of results that would trigger a RAP sooner than a scheduled review:

1) Drastic change in fishing activity. For example, if the freezer trawlers suddenly accounted for 90% of the landings. This would trigger a review because the CPUE index would no longer be valid.
2) No incoming recruitment would trigger an assessment to determine why and the consequences for management.
3) A retrospective pattern in the VPA, as this would indicate modeling, data, or other areas were leading to inappropriate advice.

Chapter 'Georges Bank ***b'***

ACTION: Present Catch, effort, CPUE, and survey trends exclusively from Georges Bank ***b*** to assess the status of this area.

Provide methodology for non-RAP years

Start of fishing on March 1 a 200t roll-over TAC is identified, although March 1 is not prescribed in the management plan.

When the TAC is close to being caught, trends in CPUE and meat weight are examined.

Science advice is sought to determine if the TAC should be rolled over.

ACTION: Provide history of justifications and decisions for roll-over TACs in order to assess the success of this management strategy.